Mr. Michael T. Davis Pre-Calculus	Units 3.1 3.2 3.3 Practice Quiz February 27, 2017

Name: Solutions

Unit 3.1

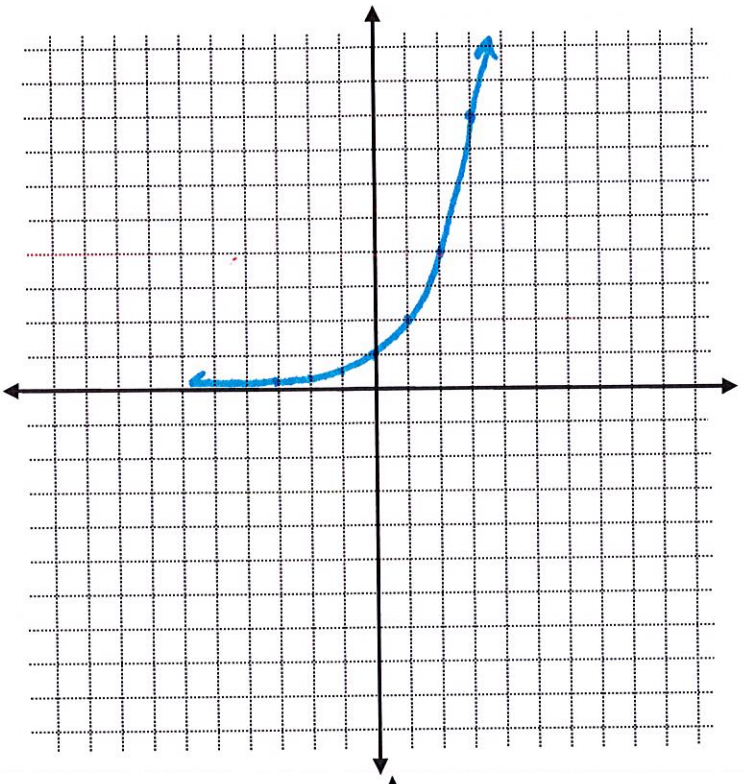
Simplify each expression. Give each answer without negative exponents.

a. $5^{-1} = \frac{1}{5}$	b. $\left(\frac{1}{7}\right)^{-1} = 7$
c. $\left(\frac{3}{2}\right)^{-1} = \frac{2}{3}$	d. $\left(\frac{3}{2}\right)^{-2} = \left(\frac{2}{3}\right)^{2} = \frac{4}{9}$
e. $8^{\frac{1}{3}} = 2$	f. $8^{\frac{2}{3}} = \left(8^{\frac{1}{3}}\right)^{2} = 2^{2} = 4$
g. $27^{\frac{4}{3}} = \left(27^{\frac{1}{3}}\right)^{4} = 3^{4} = 81$	h. $16^{\frac{3}{2}} = \left(16^{\frac{1}{2}}\right)^{3} = 4^{3} = 64$
i. $16^{\frac{3}{4}} = \left(16^{\frac{1}{4}}\right)^{3} = 2^{3} = 8$	j. $16^{\frac{5}{4}} = \left(16^{\frac{1}{4}}\right)^{5} = 2^{5} = 32$
k. $(0.1)^{-1} = \left(\frac{1}{10}\right)^{-1} = 10$	l. $(0.1)^{-2} = \left(\frac{1}{10}\right)^{-2} = 10^{2} = 100$
m. $x^{2y} \cdot x^{3y} = x^{5y}$	n. $\left(x^{2y}\right)^{3y} = x^{6y^{2}}$
o. $10 \cdot 5^{-1} = \frac{10}{5} = 2$	p. $10^{-1} \cdot 5 = \frac{5}{10} = \frac{1}{2}$
q. $4^{-2} \cdot x = \frac{x}{4^{2}} = \frac{x}{16}$	r. $4 \cdot x^{-2} = \frac{4}{x^{2}}$
s. $\left(3x^{-3}\right)^{3} = 27x^{-9} = \frac{27}{x^{9}}$	t. $\left(3^{-1}x^{3}\right)^{3} = 3^{-3}x^{9} = \frac{x^{9}}{3^{3}} = \frac{x^{9}}{27}$

Unit 3.2

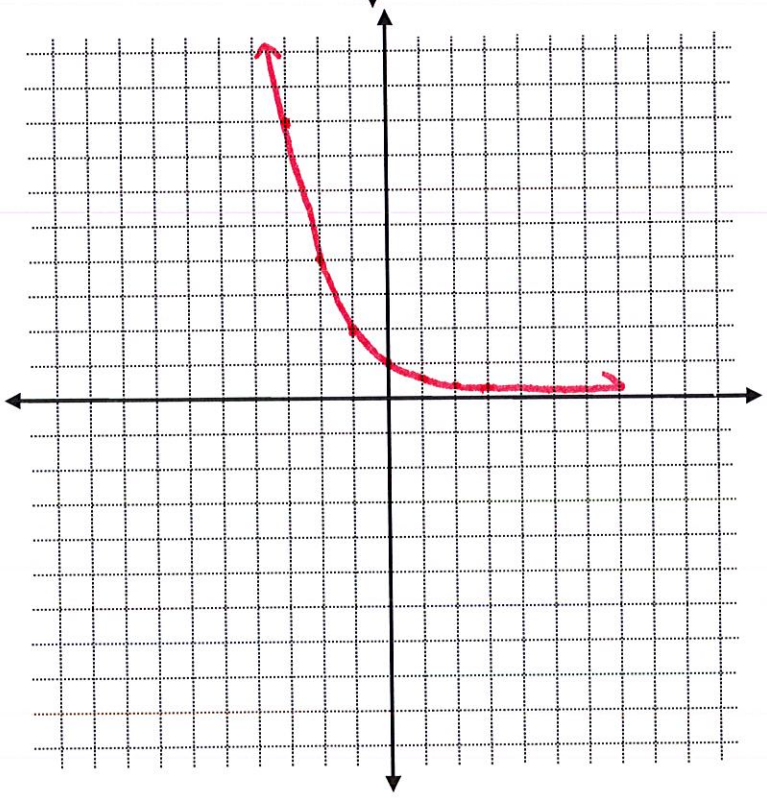
1. $f(x)=2^x$

x	Y
- 3	$\frac{1}{8}$
- 2	$\frac{1}{4}$
- 1	$\frac{1}{2}$
0	1
1	2
2	4
3	8



2. $f(x)=\left(\frac{1}{2}\right)^x$

x	Y
- 3	8
- 2	4
- 1	2
0	1
1	$\frac{1}{2}$
2	$\frac{1}{4}$
3	$\frac{1}{8}$



3.3

1. Micailah deposited $1,500 in an interest-bearing savings account for eight years. The annual interest rate is 3.5%, and the interest is compounded weekly. What will be the future value of her investment at the end of the eight-year investment period?

$A(8) = 1500\left(1 + \frac{.035}{52}\right)^{(8)(52)} \approx \$1,984.51$

2. Aasia deposited $3,500 in an interest-bearing savings account for twelve years. The annual interest rate is 4.8%, and the interest is compounded one at the end of each year. What will be the future value of her investment at the end of the twelve-year investment period?

$A(12) = 3500(1 + .048)^{12} \approx \$6,143.32$

3. Kyler deposited $550 in an interest-bearing savings account for six years. The annual interest rate is 5.4%, and the interest is compounded monthly. What will be the future value of her investment at the end of the six-year investment period?

$A(6) = 550\left(1 + \frac{.054}{12}\right)^{(6)(12)} \approx \$759.90$

4. Tyrica deposited $250 in an interest-bearing savings account for seventeen years. The annual interest rate is 6.7%, and the interest is compounded continuously. What will be the future value of her investment at the end of the seventeen-year investment period?

$A(17) = 250\, e^{(.067)(17)} \approx \$780.91$

5. Devin deposited $2,100 in an interest-bearing savings account for thirty years. The annual interest rate is 2.75%, and the interest is compounded daily. What will be the future value of the investment at the end of the thirty-year investment period?

$A(30) = 2100\left(1 + \frac{.0275}{365}\right)^{(30)(365)} \approx \$4,791.80$

6. Immanuel has 580 mg of radium-226, a radioactive isotope, with a half-life of 1,600 years. How many grams of the isotope will be radioactive after 450 years have passed?

$A(450) = 580\left(\frac{1}{2}\right)^{\frac{450}{1600}} \approx 73.24 \text{ mg}$

7. Zachary has 89 mg of tianium-44, a radioactive isotope, with a half-life of 63 years. How many grams of the isotope will be radioactive after 97 years have passed?

$A(97) = 89\left(\frac{1}{2}\right)^{\frac{97}{63}} \approx 30.61 \text{ mg}$

8. Sophie deposits $500 in an interest-bearing savings account. Over the years, she observes that her money doubles in value every 11 years. What is the value of her investment after 9 years?

$A(9) = 500(2)^{\frac{9}{11}} \approx \$881.59$

9. Sarah deposits $1,450 in an interest-bearing savings account. Over the years, she observes that her money doubles in value every 14 years. What is the value of her investment after 32 years?

$A(32) = 1450(2)^{\frac{32}{14}} \approx \$7,070.28$